

## CLASS EXERCISES

Algebra 2 GHP  
Unit #13  
WS #7

Use the discriminant to determine the nature of the solutions of each quadratic equation.

1.  $x^2 - 7x + 6 = 0$
2.  $x^2 - 8x + 12 = 0$
3.  $x^2 - 8x + 32 = 0$
4.  $x^2 + 4x + 24 = 0$
5.  $2x^2 + 10x = -9$
6.  $x^2 - 6x + 9 = 0$

Describe the relation of the graph of each function to the  $x$ -axis.

7.  $y = x^2 + 15x + 36$
8.  $y = x^2 - 8x + 16$
9.  $y = 9x^2 + 3x + 9$

## PRACTICE EXERCISES

Use the discriminant to determine the nature of the solutions of each quadratic equation.

1.  $x^2 + 6x + 6 = 0$
2.  $x^2 - 4x + 8 = 0$
3.  $x^2 + 10x + 25 = 0$
4.  $x^2 + 12x + 42 = 0$
5.  $2x^2 - 8x = 14$
6.  $2x^2 + 3x = 10$
7.  $2x^2 - 20x + 24 = 0$
8.  $2x^2 + 12x - 32 = 0$
9.  $3x^2 - 9x = 27$
10.  $2x^2 + x = 28$
11.  $2x^2 + 23x + 26 = 0$
12.  $x^2 - 12x + 36 = 0$

Describe the relation of the graph of each function to the  $x$ -axis.

13.  $y = x^2 + 3x + 5$
14.  $y = x^2 + 7x - 8$
15.  $y = x^2 - 12x + 25$
16.  $y = 2x^2 + x + 28$
17.  $y = 4x^2 - 3x - 9$
18.  $y = x^2 + 12x - 18$

Use the discriminant to determine the nature of the solutions of each quadratic equation.

19.  $-x^2 + 2x + 5 = 4$
20.  $-2x^2 - 7x - 5 = 0$
21.  $2x(x + 1) + 8 = 0$
22.  $(x - 3)(x + 6) + 4 = 0$
23.  $2x^2 - 5x + 32 = 0$
24.  $3x^2 - 5x + 5 = 0$

For each equation, determine the value(s) of  $k$  for which there will be only one solution.

25.  $4x^2 + 8x + k = 0$
26.  $kx^2 - 4x = 2$
27.  $2x^2 + kx + 8 = 0$
28.  $3x^2 + 2kx = -4$
29.  $kx^2 - kx + 2 = 0$
30.  $6x^2 - 2x + k + 1 = 0$

31. When the discriminant is positive, the graph of the quadratic function  $y = ax^2 + bx + c$  crosses the  $x$ -axis in two points. Show that the equation of the axis of symmetry of the parabola is  $x = -\frac{b}{2a}$ .

32. Describe the relation of the graph of each function to the  $x$ -axis.

$$y = x^2 - 4x + 3 \quad y = x^2 - 4x + 4 \quad y = x^2 - 4x + 5$$

Then graph the three functions on the same coordinate plane.

Describe the relation of the graph of each function to the  $x$ -axis.

33.  $y - 2 = 3x^2 - 4x$
34.  $3x^2 = 5x + 7 + y$
35.  $4x^2 = 4x - 22 - y$